Self-concept in institutionalized children with disturbed attachment

Vacaru, S.V.; Sterkenburg, P.S.; Schuengel, Carlo

published in
Child Care Health and Development
2018

DOI (link to publisher)
10.1111/cch.12521

document version
Publisher's PDF, also known as Version of record

Received: 24 January 2017 | Revised: 7 August 2017 | Accepted: 19 August 2017

DOI: 10.1111/cch.12521

WILEY

ORIGINAL ARTICLE

Self-concept in institutionalized children with disturbed attachment: The mediating role of exploratory behaviours

V. S. Vacaru[1] | P. S. Sterkenburg[2,3,4] | C. Schuengel[2,3]

[1] Donders Institute for Brain, Cognition, and Behaviour, Radboud University Nijmegen, Nijmegen, The Netherlands

[2] Department of Clinical Child and Family Studies, VU University, Amsterdam, The Netherlands

[3] EMGO+ Institute for Health and Care Research, Amsterdam, The Netherlands

[4] Bartiméus, Doorn, The Netherlands

Correspondence
Victorita Stefania Vacaru, Donders Institute for Brain, Cognition, and Behaviour, Radboud University Nijmegen, Montessorilaan 3, 6500HE, Nijmegen, The Netherlands.
Email: v.vacaru@donders.ru.nl

Abstract

Background: Self-concept is seen as both an outcome of sociocognitive and emotional development, and a factor in social and mental health outcomes. Although the contribution of attachment experiences to self-concept has been limited to quality of primary attachment relationships, little is known of the effects of disturbed attachment on self-concept in institutionalized children. Thus, the current study examined associations between disturbed attachment behaviours in institutionalized children and self-concept, testing limited exploration as an explanatory factor.

Methods: Thirty-three institutionalized children, aged 4–12, participated in a multimethod and multi-informant assessment of disturbed attachment behaviours (i.e., Disturbances of Attachment Interview and Behavioral Signs of Disturbed Attachment in Young Children), self-concept (i.e., Pictorial Scale of Perceived Competence and Social Acceptance for Young Children), and exploratory behaviours (i.e., Student Exploratory Behaviours Observation Scale). Analyses were conducted using bootstrapping techniques.

Results: Global self-concept converged with teacher-rated children's self-concept, except for physical competence domain. Disturbed attachment behaviours were identified in 62.5% of the children, and this was associated with lower levels of exploration and lower scores on self-concept, compared with children without disturbed attachment behaviours. Furthermore, exploratory behaviours mediated the effects of disturbed attachment behaviours on self-concept.

Conclusions: Institution-reared children with disturbed attachment behaviours were likely to have a negative perception of self and one's own competences. Limited exploratory behaviours explained this linkage. Targeting disordered attachment in children reared in institutions and their caregivers should become a high priority as a means for preventing socioemotional development issues.

KEYWORDS

disturbed attachment, exploration, institutionalization, self-concept

1 | INTRODUCTION

Self-concept is a complex multidimensional construct (Harter, 1996; Marsh & O'Mara, 2008; Rosenberg, 1979), conceived as the subjective cognitive representation of self and the perception of one's own competences (for a review, see Gecas, 1982; Salmivalli, 2001; Taylor, Davis-Kean, & Malanchuk, 2007). Its formation entails dynamic negotiations between others' expectations and behavioural adjustments (Leflot, Onghena, & Colpin, 2010). Positive self-concept is a core element of healthy socioemotional development (Preckel, Niepel, Schneider, & Brunner, 2013; Vogl & Preckel, 2014), whereas negative self-concept is linked with depression, anxiety, negative emotions (Fathi-Ashtiani, Ejei, Khodapanahi, & Tarkhorani, 2007; Garaigordobil, Pérez, & Mozaz, 2008; Nguyen & Scott, 2013), aggression (Stucke & Sporer, 2002; Taylor et al., 2007), and conduct disorder (Olsson & Hansson, 2009). Although self-concept is firmly linked to important life-long outcomes, little is known about self-concept in young children growing up in institutions.

One's relationships with significant others (i.e., parents, caregivers, teachers, and peers) exert a significant influence on self-concept from early childhood throughout adolescence (Blakely-McClure & Ostrov, 2016; Goodman & Coopersmith, 1969; Groze, 1992; Harter, 2006;

Preckel et al., 2013). In fact, the role of early attachment relationships and the availability of loving primary caregivers have a broader influence on self-concept. A systematic review by Wang et al. (2015) showed that Chinese children in rural areas who were left behind by their parents to find jobs in urban areas display several mental health problems and poor self-concept. Moreover, an adoptee's study revealed an association between children's attachment and self-concept difficulties, emphasizing that the amount of time and its quality spent between the child and the parent were positively related to self-concept (Groze, 1992). Additionally, recent findings revealed that self-concept mediates the relationship between childhood maltreatment and personality pathology in adulthood (Cohen, Leibu, Tanis, Ardalan, & Galynker, 2016).

Among children exposed to social neglect and inadequate caregiving during early development (i.e., severe neglect, abuse, and/or institutional deprivation), some children respond with markedly abnormal social and attachment behaviours as described in the diagnoses of reactive attachment disorder (RAD) and disinhibited social engagement disorder (DSED; American Psychiatric Association, 2013). These disorders are rather uncommon in the general population, with a 0.9% prevalence rate in young children (Chaffin, 2006; Skovgaard et al., 2007); yet a 50% prevalence rate in institutionalized children has been reported (Lionetti, Pastore, & Barone, 2015; Smyke et al., 2012). More than 17 million institutionalized orphans worldwide, with 5.2 million in South Africa (SA) alone, lack child-centred, warm, and caring caregiving conducive to adaptive sociocognitive and emotional development (Andrews, Skinner, & Zuma, 2006; Blackie, 2014; Cluver, Operario, Gardner, & Boyes, 2011; Juffer et al., 2011; United Nations Children's Fund, 2013). The high orphanhood rates in the sub-Saharan Africa, known worldwide as the African orphan crisis, are exacerbated by the HIV/AIDS epidemic crisis (Beegle, De Weerdt, & Dercon, 2009). Although many of the orphaned children in SA live in children-headed households, with extended families, or on the streets, a large number are institutionalized, with nearly 21,000 children living in just 345 registered children's homes (United Nations Children's Fund, 2011). Thus, an essential factor for healthy sociocognitive and emotional development—namely, establishing secure attachment relations with primary caregivers—is overlooked within the SA institutional context because of high child-to-caregiver ratios, exacerbated by multiple work shifts, and frequent turnover of caregivers (Barone, Dellagiulia, & Lionetti, 2015; Carlson, Hostinar, Mliner, & Gunnar, 2014; Dozier et al., 2014; Groark, Mccall, & Fish, 2011). Although institutional caregiving may safeguard physical and educational needs, the emotional needs of children are more difficult to fulfil in group-based caregiving, predisposing children to detrimental psychological outcomes (Schuengel, Oosterman, & Sterkenburg, 2009), as well as physical and behavioural problems (Woods, Farineau, & McWey, 2013).

Further compounding the issue, children reared in an institutional context lack individual attention and experience low self-esteem (Thompson, Wojciak, & Cooley, 2016), feelings of stigmatization, and devaluation of self (Kools, 1999). According to the attachment theory, wherein experiences in attachment relationships feed into a more or less coherent representation of the caregiver and self, the relationship between the caregiver and self is likely to be disrupted, which may potentially disrupt an important developmental precursor of children's self-concept, namely, the exploratory behavioural system. On the basis of the responsiveness of the caregiver and the quality of caregiving, children can form a secure attachment pattern and represent their caregivers as a secure base that activates the exploratory behavioural system and acts as a safe haven to return to when distressed (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969; Powell, Cooper, Hoffman, & Marvin, 2009; Sherman, Rice, & Cassidy, 2015). On the contrary, children who experience unresponsive caregivers form insecure attachment representations, inhibiting the exploratory behavioural system (Hoffman, Marvin, Cooper, & Powell, 2006). The exploratory behavioural system has the function to gain mastery over one's own environment (Feeney, Passmore, & Peterson, 2007; Mikulincer & Shaver, 2007), and this is a determinant factor for individual development (Sroufe, 1979), competence, and self-esteem (Bowlby, 1973). A few empirical studies sought to investigate exploratory behaviour activation and inhibition in children with secure and insecure attachment patterns. Matas, Arend, and Sroufe (1978) revealed that secure children were more effective and cooperative during a problem-solving task compared with insecure children. Convergent evidence by Frankel and Bates (1990) showed that secure children were more competent during problem-solving tasks than were insecure children, and this was directly related to mother–child relationship. Additionally, a study by Schieche and Spangler (2005) found that quality of attachment predicts task orientation and attachment–exploration balance in toddlers.

Key messages

- Children with disturbed attachment reared in institutions hold poor self-concept and show less exploratory behaviours. Moreover, exploratory behaviours mediated the relationship between disturbed attachment and self-concept. Self-concept in children also converges with teachers' reports, except for physical competence.
- Interventions within the institutional setting should focus on attachment-based treatment for the children, on the one hand; offer attachment training to the caregivers to enable them to address attachment related aspects and emotional needs, on the other hand; and ultimately promote foster care placement.
- Further research should investigate self-development in institutionalized children and test therapies for best evidence-based interventions for institutionalized children to enhance positive self-concept. Moreover, policymakers and the South African social welfare are called to assess the current state of children's homes in South Africa and whether the caregivers hold the knowledge and the emotional literacy to raise vulnerable children who are victims of abuse, neglect, and deprivation.

Developmental theories of self-identity (Erikson, 1968; Marcia, 1980; Soenens & Vansteenkiste, 2011) propose that the exploratory system is an essential process as a means to achieve successful self-identity formation through active exploration of alternatives, preferences, and choices of relevant identity aspects. Specifically, early in development, children tend to adopt identity features of significant others, mainly parents, and later build a unique identity of self through an active exploratory process (Erikson, 1968). This is less likely to happen, however, in children raised in an institutional setting, due to disrupted or nonexistent attachment relationships. Thus, we propose the hypothesis that exploratory behaviours may mediate the relationship between attachment patterns and self-concept.

Although research studies have identified the prominent role that attachment relationships play in self-concept formation in young children, very little is known about self-concept in institutionalized children with disturbed attachment behaviours. Thus, the current study aimed to elucidate the effect of disturbed attachment behaviours in institutionalized children on self-concept and test the mediation role of exploratory behaviours. To this end, we examined (a) whether self-concept in institutionalized children converges with teachers' reports of the children, (b) whether disturbed attachment behaviours in institutionalized children are associated with decreased exploratory behaviours and negative self-concept, and (c) whether exploratory behaviours mediate the effect of disturbed attachment behaviour on self-concept in institutionalized children. First, we hypothesized that institutionalized children with disturbed attachment behaviours have more negative self-concept and that their self-concept is convergent to teachers' ratings. Second, we expected that disturbed attachment behaviours will be associated with less exploratory behaviours and more negative self-concept. Third, we hypothesized that exploratory behaviours will mediate the relationship between disturbed attachment behaviours and self-concept.

2 | METHODS

2.1 | Participants

Thirty-three institutionalized children, age 4–12 years (M = 9.75, SD = 2.19), 55% boys, and the staff working at the institute (i.e., caregivers, social worker, and teachers) were included. Among these, 73% of the children were Black, 24% White, and 3% coloured. One participant was excluded from the analysis due to dismissal from the institution before completing the assessments. At the time of assessments, children had lived in the children's home for 37 months on average (SD = 23.54, min–max age: 3.21–11.86 years), and 70% of them had previous experience of institutional care (Table 1). The children's home facility in our study accommodated children with mixed backgrounds (i.e., domestic, sexual, and/or physical abuse; orphans; street children; extreme poverty and/or neglect in the family of origin; and incarcerated parents). Thus, children in this study varied in the availability of at least one parent or other family members, and subsequently the opportunity for the children to spend the weekends or holidays with them or receive visits. Moreover, specific circumstances depended on the court's decisions establishing the type of interaction with members from the family of origin or others. The institutional environment met children's primary needs (i.e., food, shelter, and education); however, due to scarcity of resources, emotional needs were rarely met. Due to the high children–caregiver ratio (7:1) and multiple shifts (three shifts), children experienced a high turnover in their care and multiple separations, precluding them from forming stable relationships. Likewise, caregivers were likely to engage in perfunctory behaviours and very few or none one-to-one interactions.

TABLE 1 Demographics

Categories	Characteristics	n = 32	M (SD)
Age		33	9.75 (2.19)
Gender	Boys Girls	55% 45%	
Ethnicity	African Caucasian Coloured	73% 24% 3%	
Time in the institute			37 months (23.54)

2.2 | Procedure

The study was conducted from February until June 2015 at a children's home in the province of Gauteng, SA. A research policy issued by the institute was signed, and approval to conduct the study was accorded. Written informed consent was obtained from the director, the social worker, and the caregivers working at the children's home, and verbal consent was obtained from children prior to participation in the study. The first author conducted the assessments and the observations with the children, caregivers, and teachers, while permanently living on the premises of the children's home. Children were assessed for self-concept. Additionally, naturalistic observations of exploratory behaviours and disturbed attachment behaviours were conducted during daily activities. Caregivers were interviewed about disturbed attachment behaviours of the children under their care. One caregiver for each child was interviewed based on observed preference of children towards this particular caregiver (e.g., more proximity seeking and contact). Prior to the interview, caregivers were asked how well they knew the child and with whom the child gets along best. When contradictions between the observation of the child's preference and the caregiver's answer arose, the interview was ended and the investigator went back to observation of the child. Only after achieving concordance between the observed preference and the preference as reported by the caregiver were the interview and the dyadic observations completed. Teachers completed a rating scale on self-perception of the children in their groups. All assessments were conducted in English, and when language difficulties were foreseen, a staff member (e.g., intern psychologist or caregiver) helped with translation and additional explanations. Language difficulties arose mainly in preschool children (three children). As English is the first language used in the schools that the children attend, the school children, caregivers, and teachers proffered sufficient English language competency to partake in the assessments.

2.3 | Measures

Self-concept was assessed with the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter, 1983; Harter & Pike, 1984) across three domains: cognitive competence,

physical competence, and peer acceptance. The scale includes a teacher report and a child self-report rating form. Psychometric properties were tested and found satisfactory in previous studies (Byrne, 1997; Mantzicopoulos, French, & Mailer, 2004). In the current sample, internal consistency varied from moderate to high: Cronbach's α coefficients of the teachers' report of children's global self-concept, cognitive competence, physical competence, and peer acceptance were .90, .95, .88, and .86, respectively; coefficients of children's own self-report of the same domains were .83, .791, .59, and .79, respectively. Previous evidence suggests that internal consistency increases with age (Davis-Kean & Sandler, 2001).

Exploratory behaviours were examined using the Student Exploratory Behaviours Observation Scale (Michaelson & Plummer, 2009) across nine dimensions: (a) attention and awareness, (b) searching and investigating skills, (c) inquiry and discovery, (d) utilization of the information gained, (e) cooperation, (f) analytic skills, (g) problem solving, (h) communication skills, and (i) creativity. These behaviours were scored by two independent observers at different time points during homework time, group therapy, and play time. The interrater agreement for independent coders was assessed with the intraclass correlation coefficient, yielding a coefficient of .63 for scores from a single coder and .77 for the aggregate of the two coders, suggesting acceptable agreement.

Symptoms of disturbed attachment behaviours were assessed by using two methods: a semistructured interview with the caregivers and a 3-month real-life observational method.

The Disturbances of Attachment Interview (DAI; Smyke et al., 2012; Gleason et al., 2011) was employed by the caregivers to assess symptoms of disturbed attachment behaviours, RAD and DSED, during a semistructured interview of eight items. Scores ranged on a 3-point Likert scale (0 = *behaviour rarely or minimally present*, 1 = *behaviour somewhat or sometimes present*, and 2 = *behaviour clearly present*). The first five items assess symptoms of RAD: (a) differentiating among adults; (b) seeking comfort from a preferred caregiver; (c) responding to comfort from caregivers when hurt, frightened, or distressed; (d) responding reciprocally with familiar caregivers; and (e) regulating emotions well with positive and developmentally expected levels of distress. The last three items assess symptoms of the DSED: (a) clearly checking back with caregiver after venturing away in unfamiliar settings, (b) exhibiting reticence with unfamiliar adults, and (c) unwillingness to go off with strangers. On the basis of the scale analysis conducted by Oosterman and Schuengel (2007), Item 4 was deleted from the analysis. The answers on DAI were transcribed verbatim and independently scored by two researchers extensively trained in attachment theory and observation of attachment in the research lab of Oosterman and Schuengel, who conducted psychometric research on the Dutch version of DAI (Oosterman & Schuengel, 2007). Discrepancies were resolved by a discussion leading to a consensus. Studies on institutionalized populations indicated good interrater reliability (Zeanah, Smyke, Koga, & Carlson, 2005), internal consistency, and criterion validity in predicting attachment disorders (Zeanah & Gleason, 2010). In the current study, the instrument was administered for the screening of attachment disorders. Children were classified into two categories, either as RAD or DSED, if they endorsed at least three out of four items from RAD subscale or at least two of the three items of DSED subscale, respectively (Giltaij, Sterkenburg, & Schuengel, 2015; Gleason et al., 2011). Endorsement of the items was accounted for, with a score of 1 or 2.

The Behavioral Signs of Disturbed Attachment in Young Children (BSDA; Boris, Fueyo, & Zeanah, 1997) was used as an observational instrument to assess signs of disturbed attachment. A recent study by Giltaij et al. (2015) demonstrated good psychometric properties. The first author observed the children and their caregivers in their natural interactions for a 3-month period (3–6 hr daily before and after children's school time), after receiving in-depth training on attachment. The instrument assesses eight types of attachment behaviours, on a 5-point Likert scale ranging from adaptive to disturbed: (a) showing affection to the caregiver, (b) seeking comfort from the caregiver, (c) relying on the caregiver for help, (d) cooperating with the caregiver, (e) showing exploratory behaviour, (f) showing controlling behaviour, (g) showing reunion responses, and (h) showing response to strangers. A sum score of all attachment behaviours was calculated. Intraclass correlation coefficient of average measures consistency yielded an acceptable reliability for a single coder of .74.

A joint classification of disturbed attachment behaviour was computed based on the two instruments (DAI and BSDA) assessing attachment behaviours. Classifications were as follows: BSDA < 22 was nondisturbed attachment behaviours, BSDA > 25 was disturbed attachment behaviour, and BSDA between 22 and 24 was classified either as one or the other, depending on whether they met the Gleason criteria for a diagnosis of disturbed attachment on the DAIs (Gleason et al., 2011). The cut-off scores of 22 and 24 were used based on the study by Giltaij et al. (2015) who found BSDA mean scores of 23.5 (*SD* = 0.71) for RAD, a score of 25 for DSED for one participant, and a mean score of 28.2 (*SD* = 3.72) for the combined diagnosis of RAD and DSED. The two instruments converged on 78% of the classifications.

2.4 | Statistical analyses

Descriptive statistics and Spearman correlation analysis of the study variables were computed. A paired-sample *t* test with a 1,000-sample bootstrapping technique compared teachers' reports with children self-reports of self-concept. To assess whether disturbed attachment behaviour is associated with less exploratory behaviours and lower scores on self-concept, a multivariate analysis with a 1,000-sample bootstrapping technique was conducted. To examine whether exploratory behaviours mediate the effects of disturbed attachment behaviour on self-concept, a mediation analysis was performed using a 5,000-sample bootstrapping technique, a nonparametric resampling procedure used to estimate the precision of the statistics (Wright, London, & Field, 2011). This technique calculates bias-corrected 95% confidence intervals around the size of the indirect effect of the mediator variable. Data were analysed using IBM SPSS Statistics 22 (IBM Corp, 2013).

3 | RESULTS

3.1 | Descriptive statistics

Children's demographic data are shown in Table 1. Disturbed attachment behaviours were found in 62.5% of children. Bivariate

Spearman correlations among study variables were examined (Table 2). Positive correlations were found between age, teachers' reports of children's global self-concept (i.e., physical competence), and exploratory behaviours. The scores on the DAI were highly correlated with the scores on the behavioural signs of disturbances of attachment. A negative association was found between behavioural signs of disturbances of attachment and global self-concept (i.e., cognitive competence) and exploratory behaviours. Self-concept was positively correlated with teachers' ratings of children's cognitive competence and exploratory behaviours. Self-perceived cognitive competence was associated with self-perceived peer acceptance, physical competence, and exploratory behaviours. Self-perceived peer acceptance also correlated with exploratory behaviours. Global teachers' ratings of children's self-concept (i.e., cognitive competence and peer acceptance) were also correlated with exploratory behaviours.

3.2 | Self-concept reports in children and teachers

Nonsignificant differences emerged between global self-concept (M = 2.87, SD = 0.50) and teachers' ratings (M = 2.68, SD = 0.52) with $t(31) = 1.77$, $p = .086$. The only significant difference was found in relation to physical competence, $t(31) = -3.39$, $p = .002$, with higher children's ratings (M = 3.26, SD = 0.54), compared with teachers' ratings (M = 2.76, SD = 0.67).

Exploratory behaviours and self-concept in children with disturbed attachment behaviour results showed a statistically significant multivariate effect of disturbed attachment behaviour on exploratory behaviours and self-concept with Wilks's $\Delta = 0.71$, $F(2, 29) = 5.86$, $p = .007$; partial $\eta^2 = .28$. Tests of between-subjects effects indicated significant main effects of disturbed attachment behaviour on exploratory behaviours, $F(1, 30) = 10.28$, $p = .003$; partial $\eta^2 = .25$, and on self-concept, $F(1, 30) = 6.13$, $p = .019$; partial $\eta^2 = .17$.

3.3 | The mediating effect of exploratory behaviours between disturbed attachment behaviour and self-concept

Disturbed attachment behaviour was negatively associated with self-concept (c path), $B = -0.42$, $t(30) = -2.47$, $p = .019$, and exploratory behaviours (a path), $B = -1.10$, $t(30) = -3.20$, $p = .003$. Moreover, exploratory behaviours were positively associated with self-concept (b path), $B = 0.19$, $t(30) = 2.21$, $p = .035$. Because both the a path and the b path were significant, a mediation analysis was performed. Exploratory behaviours mediated the effects of disturbed attachment behaviour on self-concept with a bias-corrected 95% confidence interval of [−0.59, −0.03] (n = 32), and the direct effect (c' path) of disturbed attachment behaviour on self-concept became nonsignificant, $B = -0.21$, $t(30) = -1.15$, $p = .257$, when the mediator was included in the model, suggesting a significant mediating effect (Figure 1).

TABLE 2 Spearman bivariate associations between variables in the study (n = 32)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	—	−0.26	−0.20	0.30	0.32	0.10	0.29	0.37*	0.32	0.23	0.43*	0.43*
2. DAI		—	0.36**	−0.12	−0.24	0.02	−0.02	−0.16	−0.25	−0.14	−0.01	−0.23
3. BSDA			—	−0.46**	−0.51**	−0.16	−0.22	−0.29	−0.33	−0.35*	−0.04	−0.61**
4. SC				—	0.84**	0.77**	0.61**	0.33	0.39*	0.14	0.19	0.52**
5. CC-C					—	0.45**	0.42*	0.27	0.30	0.06	0.15	0.43*
6. PA-C						—	0.22	0.21	0.22	0.18	0.08	0.39*
7. PC-C							—	0.17	0.30	−0.04	0.18	0.33
8. TP								—	0.81**	0.68**	0.69**	0.65**
9. CC-T									—	0.52**	0.32	0.70**
10. PA-T										—	0.19	0.58**
11. PC-T											—	0.31
12. SEBOS												—

Note. BSDA = behavioural signs of disturbances of attachment (sum scores); CC-C = cognitive competence (children's rating); CC-T = cognitive competence (teachers' rating); DAI = Disturbances of Attachment Interview (sum scores); PA-C = peer acceptance (children's rating); PA-T = peer acceptance (teachers' rating); PC-C = physical competence (children's rating); PC-T = physical competence (teachers' rating); SC = self-concept; SEBOS = Student Exploratory Behaviours Observation Scale; TP = teacher perception.

*$p < .05$.

**$p < .01$.

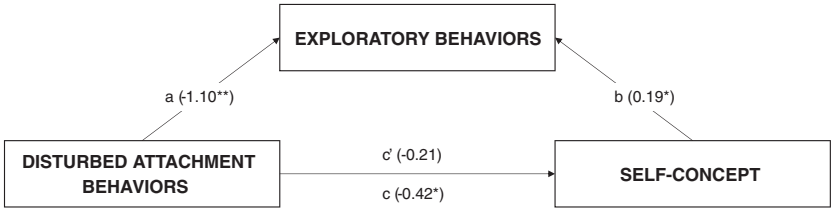

FIGURE 1 Mediation model of exploratory behaviours in the relationship between disturbed attachment and self-concept

4 | DISCUSSION

The present study examined the relationship between disturbed attachment behaviour and self-concept and tested a mediational pathway via exploratory behaviours. Our findings provide important empirical evidence in support of the notion that disturbed attachment of institutionalized children is associated with poor self-concept and point to a potentially important underlying mechanism through which these effects occur, namely, exploratory behaviours. In this study, we also investigated whether children's self-concept converges with teacher's ratings of children's self-concept, confirming our hypothesis for convergent global self-concept, cognitive competence, and peer acceptance, but not for physical competence. In fact, children rate themselves higher than do teachers on physical competence. This can be explained in line with the positive illusory bias that has been found in children with other disorders (i.e., attention deficit hyperactivity disorder; Evangelista, Owens, Golden, & Pelham, 2008; Hoza et al., 2004; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). One explanation could be that this domain is highly relevant to ensure social status and to fit in the institutional setting, and higher physical abilities represent a major desirable characteristic for children. This is in line with the children's motivational goals theory (Dweck & Leggett, 1988), suggesting that children try to prove their abilities when faced with challenges and cover their weaknesses that may pose a threat to their self-esteem. Moreover, institutionalized children may bolster their physical competence as a defensive stance, to compensate for feelings of inadequacy (Ohan & Johnston, 2002), and fit within a harsh environment, where physical aggression is frequent. Schuengel et al. (2006) found a strong link between high self-perceived physical competence and traits of aggression, which resembles a plausible explanation for this institutional setting.

Findings are consistent with past research suggesting that children with disturbed attachment behaviour (Groze, 1992) and children not reared with their parents demonstrate poor self-concept (Wang et al., 2015). Considering the empirical scarcity on self-concept in children with disturbed attachment behaviour and given that virtually no known study has investigated institutionalized children, these findings contribute greatly to the attachment and self-concept literature. To date, only two studies were conducted on attachment in SA: One study investigated attachment in preschool children with mother with HIV and HIV-related psychosis (Spies, Sterkenburg, van Rensburg, & Schuengel, 2017), whereas another study was conducted on attachment in a periurban settlement nearby Cape Town, investigating infant–mother relationships (Tomlinson, Cooper, & Murray, 2005). Yet no studies investigated the effects of disturbed attachment on exploration and self-concept in young institutionalized children.

Some limitations warrant consideration in the interpretation of the results. Due to the cross-sectional nature of this study and its small sample size, caution should be exercised in drawing conclusions. We suggest therefore to proceed this investigation through experimental and longitudinal studies with a larger sample size. Moreover, the broad age range of the children in this study warrants further consideration, given the social, motor, and cognitive development from ages 4 to 12 years. In fact, age was modestly associated with teachers' ratings of children's concept of physical competence and exploratory behaviours. Although this association may reflect a potential halo effect in the teacher report data, the limited sample size did not allow the addition of age as a covariate in subsequent analysis. However, confounding of the mediation model was controlled by using self-concept as rated by the children and not the teachers' ratings. We acknowledge the importance of potential age-related developmental differences and suggest investigating self-concept in institutionalized children at different developmental stages with a larger sample. In addition, replication studies cross-culturally are needed in support of this first evidence on self-concept in children with attachment disorders reared in institutions. More empirical, experimental, and clinical evidence is needed to draw firm conclusions about what are important factors to address to provide optimal care for institutionalized children. Yet the strength of this study is the use of a heterogeneous assessment approach with multi-informants. Moreover, the extended period of 3-month on-site naturalistic observations on a 24-hr basis allowed a deep understanding of the institutional dynamics. Continuous efforts to understand and implement solutions to improve self-concept in institutionalized children with attachment disorder should be regarded as an important channel to prevent more physical, mental, and behavioural problems in the short and long term.

4.1 | Clinical implications

This study substantially contributes to the status of research concerning institutionalization effects on attachment in SA. These findings outline an important link between attachment, exploratory behaviours, and self-concept. This linkage could be a potential target within attachment interventions, to promote higher exploration and enhance positive self-concept in institutionalized children.

The focus of therapy provided for institutionalized children should become more pronounced on attachment. Attachment-based therapy, such as Integrative Therapy for Attachment and Behavior, is a treatment aimed at children who did not have the opportunity to form selective attachment due to pathogenic care such as disruptions in early caregiving, abuse, and/or neglect (Sterkenburg, Janssen, & Schuengel, 2008). Moreover, empirical evidence suggests that this intervention can be combined with behavioural intervention, aiming at modifying maladaptive behaviours and replace it with adaptive behaviours (Schuengel, Sterkenburg, Jeczynski, Janssen, & Jongbloed, 2009; Sterkenburg, Schuengel, & Janssen, 2008). Group interventions can be proposed for institutionalized children; however, in the presence of highly challenging behaviours, one-to-one intervention should be considered. Nevertheless, the costs for institutions may be too high to provide individualized treatments from therapists. Providing training and/or self-guided learning material to caregivers, thus, is an important way to teach them to address attachment behaviours and the emotional needs of the children, which will ultimately contribute to more exploration to master one's environment and consequently to positive self-concept (Schuengel, de Schipper, Sterkenburg, & Kef, 2012).

To conclude, millions of children grow in institutions, and millions of institutionalized children experience detrimental social, emotional, and mental health outcomes. Clinicians, researchers, and policymakers have a great responsibility to address these outcomes, also by promoting foster care placements within a family environment.

ACKNOWLEDGEMENTS

We wish to thank, first of all, the children in the children's home for their collaboration and kindness to participate in our research study. Second, we thank the caregivers and the staff of the institute for consenting to participate in this study and offering their collaboration and knowledge. Moreover, we wish to express great appreciation for their valuable work in the everyday life with the children.

ORCID

V. S. Vacaru http://orcid.org/0000-0001-6897-2963

P. S. Sterkenburg http://orcid.org/0000-0001-6014-7539

REFERENCES

Ainsworth, M., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Andrews, G., Skinner, D., & Zuma, K. (2006). Epidemiology of health and vulnerability among children orphaned and made vulnerable by HIV/AIDS in sub-Saharan Africa. *AIDS Care*, *18*(3), 269–276. https://doi.org/10.1080/09540120500471861

Barone, L., Dellagiulia, A., & Lionetti, F. (2015). When the primary caregiver is missing: Investigating proximal and distal variables involved in institutionalized children's adjustment. *Child Abuse Review*, *25*(6), 454–468. https://doi.org/10.1002/car.2365

Beegle, K., De Weerdt, J., & Dercon, S. (2009). The intergenerational impact of the African orphans' crisis: A cohort study from an HIV/AIDS affected area. *International Journal of Epidemiology*, *38*(2), 561–568. https://doi.org/10.1093/ije/dyn197

Blackie, D. (2014). Fact sheet on child abandonment research in South Africa.

Blakely-McClure, S. J., & Ostrov, J. M. (2016). Relational aggression, victimization and self-concept: Testing pathways from middle childhood to adolescence. *Journal of Youth and Adolescence*, *45*(2), 376–390. https://doi.org/10.1007/s10964-015-0357-2

Boris, N. W., Fueyo, M., & Zeanah, C. H. (1997). The clinical assessment of attachment in children under five. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 291–293. https://doi.org/10.1097/00004583-199702000-00020

Bowlby, J. (1969). Attachment and loss: Volume I: Attachment. *The International Psycho-Analytical Library*, *79*, 1–401.

Bowlby, J. (1973). *Attachment and loss: II. Separation. Anxiety and anger*. London: Hogarth.

Byrne, B. M. (1997). Measuring Self-concept Across the Life Span. *Psyccritiques*, *42*(2), 173. https://doi.org/10.1037/000629

Carlson, E., Hostinar, C., Mliner, S., & Gunnar, M. R. (2014). The emergence of attachment following early social deprivation. *Development and Psychopathology*, *26*, 1–11. https://doi.org/10.1017/S0954579414000078

Chaffin, M. (2006). Report of the APSAC task force on attachment therapy, reactive attachment disorder, and attachment problems. *Child Maltreatment*, *11*(1), 76–89. https://doi.org/10.1177/1077559505283699

Cluver, L., Operario, D., Gardner, F., & Boyes, M. E. (2011). A family disease: mental health of children orphaned by AIDS and living with HIV+ caregivers. *International Perspectives on Children and Mental Health [2 Volumes]*, *2*, 65. Santa Barbara, CA: ABC-CLIO, LLC.

Cohen, L., Leibu, O., Tanis, T., Ardalan, F., & Galynker, I. (2016). Disturbed self-concept mediates the relationship between childhood maltreatment and adult personality pathology. *Comprehensive Psychiatry*, *68*, 186–192. https://doi.org/10.1016/j.comppsych.2016.04.020

Davis-Kean, P. E., & Sandler, H. M. (2001). A meta-analysis of measures of self-esteem for young children: A framework for future measures. *Child Development*, *72*, 887–906. https://doi.org/10.1111/1467-8624.00322

Dozier, M., Kaufman, J., Kobak, R., O'Connor, T. G., Sagi-Schwartz, A., Scott, S., … Zeanah, C. H. (2014). Consensus statement on group care for children and adolescents: A statement of policy of the American Orthopsychiatric Association. *American Journal of Orthopsychiatry*, *84*, 219–225. https://doi.org/10.1037/ort0000005

Dweck, C. S., & Leggett, E. L. (1988). A social–cognitive approach to motivation and personality. *Psychological Review*, *95*(2), 256. https://doi.org/10.1037/0033-295X.95.2.256

Erikson, E. (1968). *Youth: Identity and crisis*. New York, NY: WW.

Evangelista, N. M., Owens, J. S., Golden, C. M., & Pelham, W. E. (2008). The positive illusory bias: Do inflated self-perceptions in children with ADHD generalize to perceptions of others? *Journal of Abnormal Child Psychology*, *36*(5), 779–791. https://doi.org/10.1007/s10802-007-9210-8

Fathi-Ashtiani, A., Ejei, J., Khodapanahi, M. K., & Tarkhorani, H. (2007). Relationship between self-concept, self-esteem, anxiety, depression and academic achievement in adolescents. *Journal of Applied Sciences*, *7*(7), 955–1000. https://doi.org/10.3923/jas.2007.995.1000

Feeney, J. A., Passmore, N. L., & Peterson, C. C. (2007). Adoption, attachment, and relationship concerns: A study of adult adoptees. *Personal Relationships*, *14*, 129–147. https://doi.org/10.1111/j.1475-6811.2006.00145.x

Frankel, K. A., & Bates, J. E. (1990). Mother–toddler problem solving: Antecedents in attachment, home behavior, and temperament. *Child Development*, *61*(3), 810–819. https://doi.org/10.1111/j.1467-8624.1990.tb02823.x

Garaigordobil, M., Pérez, J. I., & Mozaz, M. (2008). Self-concept, self-esteem and psychopathological symptoms. *Psicothema*, *20*(1), 114–123. https://doi.org/10.1017/S1138741600006405

Gecas, V. (1982). The self-concept. *Annual Review of Sociology*, *8*(1), 1–33.

Giltaij, H. P., Sterkenburg, P. S., & Schuengel, C. (2015). Psychiatric diagnostic screening of social maladaptive behavior in children with mild intellectual disability: Differentiating disordered attachment and pervasive developmental disorder behavior. *Journal of Intellectual Disability Research*, *59*(2), 138–149. https://doi.org/10.1111/jir.12079

Gleason, M. M., Fox, N. A., Drury, S., Smyke, A., Egger, H. L., Nelson, C. A., … Zeanah, C. H. (2011). Validity of evidence-derived criteria for reactive attachment disorder: Indiscriminately social/disinhibited and emotionally withdrawn/inhibited types. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*, 216–231. https://doi.org/10.1016/j.jaac.2010.12.012

Goodman, N., & Coopersmith, S. (1969). The antecedents of self-esteem. *American Sociological Review*, *34*(1), 116.

Groark, C. J., Mccall, R. B., & Fish, L. (2011). Characteristics of environments, caregivers, and children in three Central American orphanages. *Infant Mental Health Journal*, *32*(2), 232–250. https://doi.org/10.1002/imhj.20292

Groze, V. (1992). Adoption, attachment and self-concept. *Child & Adolescent Social Work Journal*, *9*(2), 169–191. https://doi.org/10.1007/BF00755231

Harter, S. (1983). Development perspectives on the self system. In P. H. Mussen (Series Ed.) & M. Hetherington (Vol. Ed.), *Handbook of child psychology: Vol. 4. Socialization, personality, and socialdevelopment* (pp. 275–385). New York: Wiley.

Harter, S. (1996). Historical roots of contemporary issues involving self-concept. In B.A. Bracken (Ed.), *Handbook of self-concept: Developmental, social, and clinical considerations* (pp. 1–37). New York: Wiley.

Harter, S. (2006). Developmental and individual difference perspective on self-esteem. In Mroczek D. K., Little T. D. (Eds.), *Handbook of personality development* (pp. 311–334). Mahwah, NJ: Lawrence Erlbaum.

Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development*, 1969–1982. https://doi.org/10.2307/1129772

Hoffman, K. T., Marvin, R. S., Cooper, G., & Powell, B. (2006). Changing toddlers' and preschoolers' attachment classifications: The circle of security intervention. *Journal of Consulting and Clinical Psychology*, *74*(6), 1017–1026. https://doi.org/10.1037/0022-006X.74.6.1017

Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham, W. E. Jr., Molina, B. S., … Odbert, C. (2004). Self-perceptions of competence in children with ADHD and comparison children. *Journal of Consulting and Clinical Psychology*, *72*(3), 382. https://doi.org/10.1037/0022-006X.72.3.382

IBM Corp (2013). *IBM SPSS statistics for Windows*. Armonk, NY: IBM Corp.

Juffer, F., Palacios, J., Le Mare, L., Sonuga-Barke, E. J. S., Tieman, W., Bakermans-Kranenburg, M. J., … Verhulst, F. C. (2011). II. Development of adopted children with histories of early adversity. *Monographs of the Society for Research in Child Development*, *76*(4), 31–61. https://doi.org/10.1111/j.1540-5834.2011.00627.x

Kools, S. (1999). Self-protection in adolescents in foster care. *Journal of Child and Adolescent Psychiatric Nursing*, *12*(4), 139–152. https://doi.org/10.1111/j.1744-6171.1999.tb00063.x

Leflot, G., Onghena, P., & Colpin, H. (2010). Teacher–child interactions: Relations with children's self-concept in second grade. *Infant and Child Development*, *19*(4), 385–405. https://doi.org/10.1002/icd.672

Lionetti, F., Pastore, M., & Barone, L. (2015). Attachment in institutionalized children: A review and meta-analysis. *Child Abuse and Neglect*, *42*, 135–145. https://doi.org/10.1016/j.chiabu.2015.02.013

Mantzicopoulos, P., French, B. F., & Mailer, S. J. (2004). Factor structure of the pictorial scale of perceived competence and social acceptance with two pre-elementary samples. *Child Development*, *75*(4), 1214–1228. https://doi.org/10.1111/j.1467-8624.2004.00734.x

Marcia, J. E. (1980). Identity in adolescence. *Handbook of Adolescent Psychology*, *9*(11), 159–187.

Marsh, H. W., & O'Mara, A. (2008). Reciprocal effects between academic self-concept, self-esteem, achievement, and attainment over seven adolescent years: Unidimensional and multidimensional perspectives of self-concept. *Personality and Social Psychology Bulletin*, *34*(4), 542–552. https://doi.org/10.1177/0146167207312313

Matas, L., Arend, R. A., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development*, 547–556. https://doi.org/10.2307/1128221

Michaelson, K., Plummer, C. (2009). Student exploratory behaviors observation scale.

Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, *18*(3), 139–156. https://doi.org/10.1080/10478400701512646

Nguyen, H. T., & Scott, A. N. (2013). Self-concept and depression among children who experienced the death of a family member. *Death Studies*, *37*(3), 197–211. https://doi.org/10.1080/07481187.2011.634085

Ohan, J. L., & Johnston, C. (2002). Are the performance overestimates given by boys with ADHD self-protective? *Journal of Clinical Child and Adolescent Psychology*, *31*(2), 230–241. https://doi.org/10.1207/S15374424JCCP3102_08

Olsson, M., & Hansson, K. (2009). A long-term follow-up study of adolescents with conduct disorder: Can outcome be predicted from self-concept and intelligence? *Nordic Journal of Psychiatry*, *63*(6), 454–461. https://doi.org/10.3109/08039480903009100

Oosterman, M., & Schuengel, C. (2007). Autonomic reactivity of children to separation and reunion with foster parents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *46*(9), 1196–1203. https://doi.org/10.1097/chi.0b013e3180ca839f

Owens, J. S., Goldfine, M. E., Evangelista, N. M., Hoza, B., & Kaiser, N. M. (2007). A critical review of self-perceptions and the positive illusory bias in children with ADHD. *Clinical Child and Family Psychology Review*, *10*(4), 335–351. https://doi.org/10.1007/s10567-007-0027-3

Powell, B., Cooper, G., Hoffman, K., & Marvin, S. R. (2009). The circle of security. *Handbook of Infant Mental Health*, *3*, 450–467.

Preckel, F., Niepel, C., Schneider, M., & Brunner, M. (2013). Self-concept in adolescence: A longitudinal study on reciprocal effects of self-perceptions in academic and social domains. *Journal of Adolescence*, *36*(6), 1165–1175. https://doi.org/10.1016/j.adolescence.2013.09.001

Rosenberg, M. (1979). Conceiving the self. *Contemporary Sociology*, *9*, 319.

Salmivalli, C. (2001). Feeling good about oneself, being bad to others? Remarks on self-esteem, hostility, and aggressive behavior. *Aggression and Violent Behavior*, *6*(4), 375–393. https://doi.org/10.1016/S1359-1789(00)00012-4

Schieche, M., & Spangler, G. (2005). Individual differences in biobehavioral organization during problem-solving in toddlers: The influence of maternal behavior, infant–mother attachment, and behavioral inhibition on the attachment–exploration balance. *Developmental Psychobiology*, *46*(4), 293–306. https://doi.org/10.1002/dev.20065

Schuengel, C., de Schipper, J. C., Sterkenburg, P. S., & Kef, S. (2012). Attachment, intellectual disabilities, and mental health: Research, assessment, and intervention. *Journal of Applied Research in Intellectual Disabilities*, *26*(1), 34–46. https://doi.org/10.1111/jar.12010

Schuengel, C., Oosterman, M., & Sterkenburg, P. S. (2009). Children with disrupted attachment histories: Interventions and psychophysiological indices of effects. *Child and Adolescent Psychiatry and Mental Health*, *3*(1), 26. https://doi.org/10.1186/1753-2000-3-26

Schuengel, C., Sterkenburg, P. S., Jeczynski, P., Janssen, C. G. C., & Jongbloed, G. (2009). Supporting affect regulation in children with multiple disabilities during psychotherapy: A multiple case design study of therapeutic attachment. *Journal of Consulting and Clinical Psychology*, *77*(2), Apr), 291–301. https://doi.org/10.1037/a0014274

Schuengel, C., Voorman, J., Stolk, J., Dallmeijer, A., Vermeer, A., & Becher, J. (2006). Self-worth, perceived competence, and behaviour problems in children with cerebral palsy. *Disability and Rehabilitation*, *28*(20), 1251–1258. https://doi.org/10.1080/09638280600554652

Sherman, L. J., Rice, K., & Cassidy, J. (2015). Infant capacities related to building internal working models of attachment figures: A theoretical and empirical review. *Developmental Review*, *37*, 109–141. https://doi.org/10.1016/j.dr.2015.06.001

Skovgaard, A. M., Houmann, T., Christiansen, E., Landorph, S., Jørgensen, T., Olsen, E. M., … Lichtenberg, A. (2007). The prevalence of mental health problems in children 1(1/2) years of age—The Copenhagen Child Cohort 2000. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *48*(1), 62–70. https://doi.org/10.1111/j.1469-7610.2006.01659.x

Smyke, A. T., Zeanah, C. H., Gleason, M. M., Drury, S. S., Fox, N. A., Nelson, C. A., & Guthrie, D. (2012). A randomized controlled trial comparing foster care and institutional care for children with signs of reactive attachment disorder. *American Journal of Psychiatry*, *169*(5), 508–514. https://doi.org/10.1176/appi.ajp.2011.11050748

Soenens, B., & Vansteenkiste, M. (2011). When is identity congruent with the self? A self-determination theory perspective. In *Handbook of identity theory and research* (pp. 381–402). New York, NY: Springer.

Spies, R., Sterkenburg, P. S., van Rensburg, E., & Schuengel, C. (2017). HIV/AIDS and psychosis: Needs, challenges and support of affected mothers. *Journal of Child and Family Studies*, *26*(1), 183–193. https://doi.org/10.1007/s10826-016-0543-1

Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist*, *34*(10), 834. https://doi.org/10.1037/0003-066X.34.10.834

Sterkenburg, P. S., Janssen, C. G. C., & Schuengel, C. (2008). The effect of an attachment-based behaviour therapy for children with visual and severe intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, *21*(2), 126–135. https://doi.org/10.1111/j.1468-3148.2007.00374.x

Sterkenburg, P. S., Schuengel, C., & Janssen, C. G. C. (2008). Developing a therapeutic relationship with a blind client with a severe intellectual disability and persistent challenging behaviour. *Disability and*

Rehabilitation, *30*(17), 1318–1327. https://doi.org/10.1080/09638280701482597

Stucke, T. S., & Sporer, S. L. (2002). When a grandiose self-image is threatened: Narcissism and self-concept clarity as predictors of negative emotions and aggression following ego-threat. *Journal of Personality*, *70*(4), 509–532. https://doi.org/10.1111/1467-6494.05015

Taylor, L. D., Davis-Kean, P., & Malanchuk, O. (2007). Self-esteem, academic self-concept, and aggression at school. *Aggressive Behavior*, *33*(2), 130–136. https://doi.org/10.1002/ab.20174

Thompson, H. M., Wojciak, A. S., & Cooley, M. E. (2016). Self-esteem: A mediator between peer relationships and behaviors of adolescents in foster care. *Children and Youth Services Review*, *66*, 109–116. https://doi.org/10.1016/j.childyouth.2016.05.003

Tomlinson, M., Cooper, P., & Murray, L. (2005). The mother–infant relationship and infant attachment in a South African peri-urban settlement. *Child Development*, *76*(5), 1044–1054. https://doi.org/10.1111/j.1467-8624.2005.00896.x

United Nations Children's Fund. (2011). Protection for orphans and vulnerable children: Alternative care.

United Nations Children's Fund South Africa. (2013). South Africa: Annual report.

Vogl, K., & Preckel, F. (2014). Full-time ability grouping of gifted students: Impacts on social self-concept and school-related attitudes. *Gifted Child Quarterly*, *58*(1), 51–68. https://doi.org/10.1177/0016986213513795

Wang, X., Ling, L., Su, H., Cheng, J., Jin, L., & Sun, Y. H. (2015). Self-concept of left-behind children in China: A systematic review of the literature. *Child: Care, Health and Development*, *41*(3), 346–355. https://doi.org/10.1111/cch.12172

Woods, S. B., Farineau, H. M., & McWey, L. M. (2013). Physical health, mental health, and behaviour problems among early adolescents in foster care. *Child: Care, Health and Development*, *39*(2), 220–227. https://doi.org/10.1111/j.1365-2214.2011.01357.x

Wright, D. B., London, K., & Field, A. P. (2011). Using bootstrap estimation and the plug-in principle for clinical psychology data. *Journal of Experimental Psychopathology*, *2*(2), 252–270.

Zeanah, C. H., Gleason, M. M. (2010). Reactive attachment disorder: A review for DSM-V. Report presented to the American Psychiatric Association.

Zeanah, C. H., Smyke, A. T., Koga, S. F., & Carlson, E. (2005). Attachment in institutionalized and community children in Romania. *Child Development*, *76*, 1015–1028. https://doi.org/10.1111/j.1467-8624.2005.00894.x

How to cite this article: Vacaru VS, Sterkenburg PS, Schuengel C. Self-concept in institutionalized children with disturbed attachment: The mediating role of exploratory behaviours. *Child Care Health Dev*. 2018;44:476–484. https://doi.org/10.1111/cch.12521